



CITY OF SANTA BARBARA

COUNCIL AGENDA REPORT

AGENDA DATE: December 15, 2009

TO: Mayor and Councilmembers

FROM: Water Resources Division, Public Works Department

SUBJECT: Contract For Groundwater Modeling Program

RECOMMENDATION: That Council:

- A. Approve a three-year cooperative water resources program between the City and the U.S. Geological Survey (USGS) to update and enhance groundwater models; evaluate the sustainable yield of the City's groundwater resources; and develop decision rules for use in managing supplies from groundwater; and
- B. Authorize the Public Works Director to execute annual Joint Funding Agreements with the USGS for Fiscal Years 2010, 2011, and 2012, to implement the three-year program, with the City's portion of the aggregate cost not to exceed \$376,925.

DISCUSSION:

Background

Groundwater is an important part of the City's water supply, supplying approximately 1,000 acre-feet per year (AFY) in normal years (7% of total demand), and up to 4,500 AFY during a critical drought period (32% of total demand). Groundwater is also the City's only readily available supply of potable water in the event deliveries from the Santa Ynez River are disrupted. The City's groundwater basins are relatively small compared to other local agencies and must be managed carefully to optimize their role in our water supply.

The City has a long standing relationship with USGS on groundwater supply as well as other issues. Over the years, USGS has written the definitive reports describing the geology and capacity of the City's groundwater basins. They have also developed and maintained groundwater models of each basin. The most recent effort was the development of the Multiple Objective Optimization Model (MOOM) in the early 1990's, which integrated modeling of groundwater with other City water supplies to identify optimal supply scenarios under various conditions. Intrusion of seawater into Storage Unit No. 1 (in the downtown area) is of particular concern because saline groundwater is drawn into the groundwater basin during periods of increased pumping, which occurs

during a drought. Groundwater levels recover relatively quickly after pumping is reduced, but the seawater interface is much slower to return to its prior location. Therefore, tracking this interface is important in terms of estimating the amount of pumping that can be done before the salt content in a given well renders it unusable for potable supply for a substantial period of time.

MOOM was used to evaluate groundwater supplies as a part of the development of the current Long Term Water Supply Program (LTWSP), adopted in 1994. In conjunction with the Plan Santa Barbara process, staff is reviewing information on all of the City's water supplies for use in developing a recommendation to the Water Commission and City Council for an updated LTWSP.

Proposed Cooperative Water Resources Program

The proposed program would consist of four phases conducted over a three-year period:

1. Quantify the present sustainable yield of the Santa Barbara groundwater basins;
2. Evaluate the future sustainable yield of the basins given historical weather variability as well as potential climate change effects;
3. Develop decision rules for evaluating the current status of the basins at any given time; and
4. Document the result of the work in one or more reports.

The work will include the development and calibration of a three-dimensional model of seawater intrusion, building on a two-dimensional model that was developed as part of the earlier MOOM effort. The result will be a more sophisticated model of the quantity of groundwater flow, as well as the quality, in terms of salt content and extent of intrusion. This will allow the City to estimate the location of the saltwater/freshwater interface and the rate at which it can be expected to move inland toward City wells if pumping were to continue in response to extended drought.

Since we never know when a drought will end, such information will be important in managing our supplies and planning for the contingency of one or more additional years of drought. Similar analyses will be conducted for the City's other groundwater basins, focusing on public and private pumping demands and the effect on overall groundwater levels and sustainable yield.

One of the products of this analysis will be a series of graphs that can be used to assess the amount of available groundwater production, based on field measurements that reflect the current level of groundwater in the basins. The reporting phase will include archiving of all input data sets, and data output and preparation of a peer-reviewed article documenting the work effort.

Staff anticipates using the expertise of USGS personnel and early modeling results in developing recommendations on the groundwater component of the LTWSP update. Upon completion of the three-year study, the developed tools will contribute to the “adaptive management” of the City’s water supply, in a manner similar to that proposed to monitor other City resources being assessed in the *Plan Santa Barbara* process. The proposed three-year study was presented to the City Water Commission at its meeting of October 12, 2009, at which time there was a consensus of strong support for utilizing the expertise of USGS to update the City’s groundwater analysis tools.

BUDGET/FINANCIAL INFORMATION:

The total cost of the three-year program is estimated at \$546,055. USGS proposes to contribute \$169,130, with a City share of \$376,925. The work would be approved by each party in three annual contracts. The payment obligations are subject to available appropriations, and either party can withdraw if appropriations are not available. Staff anticipates a first-year contract amount of approximately \$191,530, with a City share of \$133,500. Funds are available in the 2010 Water Fund Operating Budget for the entire three-year City share.

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APPROVED BY: City Administrator’s Office